

## Mobile Games Platforms for Teachers' Entrepreneurship in Education

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### Abstract

The development of educational games is one form of school's entrepreneurship. Teachers might create the games based on their expertise and knowledge using the most familiar game engines. The high number of teachers who share their expertise and knowledge through the education game will create bigger multiplier effect for teachers, schools and students. One of easy tools to be used for teachers in developing the educational game is RPG Maker. However, the products are not so interesting for the students because they have to play in the personal computer (PC) while the small computer called smartphone and tablet computer are most widely used. Increasing the joy and easiness to play the games is the important part in the educational games. The objective is not only to increase the successfulness of the learning, but also to increase the possibility in the school entrepreneurship. This paper will present the strategy to transform the game products for the smartphone and tablet computer and make the teacher able to create the educational games more easily. The provision of a prototype for mobile game making and a procedure for mobile game publishing will be discussed and compared with the responses of teachers. Feedbacks on the ease of use of the tool, creation of the games, and the confidence in publishing the games were used to build a model of mobile games development for teachers' entrepreneurship in education. The model is expected to support teachers in developing school's entrepreneurship through the development of interesting educational game.

*Keywords:* Educational games, Game development, Games platform, Mobile games prototype, Role-playing game, School entrepreneurship

Teachers who own the expertise and knowledge have the opportunity to create the educational games by themselves. However, the technical aspect is one of concerns to be able to produce computer-based products. They might have to learn the computer knowledge in certain time to be able to create game software. It will take time and infeasible compared to giving their idea to the game developer. The solution discussed in the previous paper (R. Sanjaya, Soekesi, & Sitohang, 2015) is providing the most simple game engine for the teachers to facilitate them to create games without having any computer programming skills.

The game engine used in the workshop was RPG Maker which has been able to facilitate the teachers to create the Role-Play Games based on their courses. The adventure in finding the answers is the most common game play produced after the workshop. The educational games created by the teachers have been shown at [www.gamebelajar.com](http://www.gamebelajar.com). This site has been prepared since the workshop in order to promote the teachers' products to the internet users. The objectives are to introduce the teachers' products, to enhance the teacher's confidence in producing the educational game, and to bridge towards entrepreneurship educational game.

However, even though attractive appearance and interesting story in the game has been developed by the teachers, the products could not attract the students. It is because the products have to be played on personal computers (PC) while the smartphone and tablet computer are the most widely used by children and youth. Teachers might have to be adapted to adjust the current condition because the objective of educational games is not only to support the learning process, but also to increase the possibility in the school entrepreneurship. When the game becomes more desirable, entrepreneurial opportunities are also getting bigger.

The technical aspect to transform the games into mobile games should be re-adjusted. Learning another game engine with special ability in mobile games development will be another challenge for the teachers because they might have to learn from scratch. The game engine also has a possibility of the unsuitable for each teacher. It might need to construct a strategy in order to transform the game products for the smartphone and tablet computer by considering the ease of use of the tool for teachers.

### Literature Study

Educational Game or game-based learning is a term to show an advanced approach in the learning process using digital games. The approach is integrating the interactive aspects on the computer to provide creative and richer educational experiences to students. It is an evolution from conventional teaching method to interactive teaching method which allows the students to explore, attempt the challenges, make decisions, and solve the problems (Sugianto & Wiradinata, 2012).

The educational game is increasingly being used as a learning tool in several school levels (Alsagoff, 2005) and categorized as the big innovation in the electronic-based learning development. The educational game production will trigger the teacher's entrepreneurship spirit. The teacher's creative and innovative works will create financial freedom of schools (R. S. Sanjaya, Soekesi, & Sitohang, 2015).

The success story of gaming industry has been inspiring many game developers to see the potential of educational games in the future. Based on Ambient Insight's research, game-based learning successfully generated the revenues \$1.5 billion in 2012 (Adkins, 2013), increased \$1.7 billion in 2013 (Greer, 2014), and increased \$1.8 billion in 2014 (Adkins, 2015a). At the same period, the revenues in Asia region were increased from \$1.0 billion (2012) to \$1.1 billion (2014). The revenues have been predicted will grow \$4.95 billion by 2019 or 21.9 percent within five years.

Table 1

*Worldwide and Asia Games-based Learning Revenues (in US\$ millions)*

<b>Region\Year</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Worldwide	\$1,548.44	\$1,739.55	\$1,841.41
Asia	\$1,029.43	\$1,115.89	\$1,123.45

Source: Ambient Insight's Research Report 2013, 2014, and 2015

However, the mobile devices technology booming in the last few years has stimulates the educational games developer broaden the game development area into mobile devices. According to Ambient Insight's research, the global market for mobile learning products and services reached 8.4 billion in 2014 (Adkins, 2015b). Mobile Educational Games is one of products in the

mobile learning which utilizes the mobile devices such as smartphone and computer tablet to play the educational game.

An approach to develop games for non programmer is creating a prototype as a modeling wizard (Hoppenbrouwers & Schotten, 2009). Game prototyping is often to be used as a method to shorten the time and fasten the process in the games development by using an example with necessary libraries or components. The prototype could be a miniature or an incomplete version of games software with no concern for its efficiency, performance, and functions.

### Concepts Overview

In the previous workshop, the teachers used RPG Maker to develop educational games from scratch. It is an easy tool to create games for personal computer without any programming background. However, the products are not able to get more attention from the students who use smartphones and computer tablets more often than personal computer. Another perspective, the big entrepreneurial opportunities in the mobile learning need to be achieved through the educational games platform transformation.

Workshop of mobile educational games was held in order to examine the appropriate mobile games platform making for teachers in the different school levels. The purpose of the platform provision is to ease educational games creation which can be played on mobile devices. At the workshop, the teachers start the game development by utilizing a ready-used game prototype for mobile devices. The prototype is a project consists of the opening graphics, the closing graphics, a collection of appropriate characters, several required scripts, and a simple example as an initial of game design.

An application called Neko RPGXP need to be installed in smartphones and computer tablets based on Android to run the games. However, the prototype provided has adjusted some limitations in the game player in order to make the game looks good as the original.



*Figure 1.* Workshop and survey of mobile educational games development

From a hundred participants of the previous workshop a year ago, 30 teachers from kindergarten to high school have been invited and surveyed to get any feedbacks after the mobile educational games workshop on 2015. As the result, 67 percent respondents stated has been helped by the use of the prototype for game development, but 77 percent respondents expressed the need of more rehearsal to get used in using the prototype. Then, 80 percent of respondents agreed if the game should be able to play via mobile devices. 67 percent respondents stated mobile games have great opportunities to be used by students.

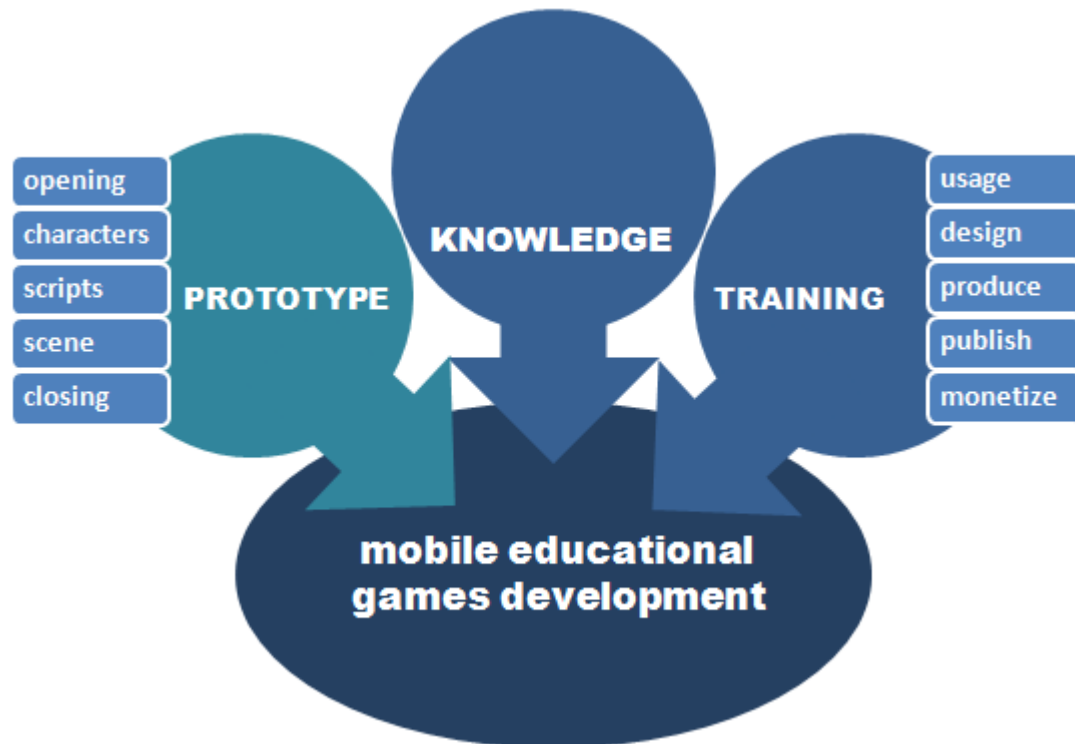
Table 1  
*Survey of mobile educational games development*

Questionnaires	Agree	Disagree
teacher has been helped by the use of the prototype	67	33
teacher need more rehearsal to get used in using the prototype	77	23
game should be able to play via mobile devices	80	20
mobile games have great opportunities to be used by students	67	33
teacher has the confidence to sell their games on the market	57	43

However, 43 percent expressed no confidence to sell their games on the market. The reasons are not just about the worries of their new ability could not meet the market standard, but also the teachers had no experience in selling IT products. It is need to have different approach in the school entrepreneurship implementation. Educational games funding does not always have correlation with the selling products activity. For initial of game development, funding can be obtained through advertising for mobile application. Therefore, the teachers do not feel burdened to sell their products to their own students.

### Model Development

Based on the feedbacks, a model for educational mobile game development for teachers can be generated. Model produced in the workshop of mobile educational games can be seen in the image below. The first component is knowledge as a teacher's capital in the development of educational games needs to be combined with Prototype as the second component. This component has been equipped with a good packaging such as the graphics for opening and closing the game. In addition, it is required the availability of appropriate characters for the interesting learning, the scripts to make the game become more interesting and interactive, as well as the scene example that has been created in the prototype to ease the teachers to develop games become more interesting with a shorter time. Training is the third component that is needed for teachers to understand the prototype usage. Additionally, the technique in developing the game design based on available prototype and producing the application is part of habituation that should be repeated. If the teachers practice more frequently, they are getting accustomed to generate a better game from time to time. After teachers are proficient in using the prototype and produce applications, the steps to publish the game for public and to do monetizing will be a part that can be done to improve towards the entrepreneurial school.



*Figure 1.* Model of mobile games development for teachers

Implementation of this model can be performed in a different game engine with different games product. The availability of mobile games prototype can be produced and provided by unit of entrepreneurship development of IT-based school or obtained from the project in cooperation with external parties who have an IT background.

### Conclusions

Transformation of educational games into mobile educational games is inevitable. The purpose of the transformation is leveraging the game product to be more widely used by many students. However, the ease in development of mobile educational games is in the high priority to guarantee the sustainable entrepreneurship in school. Provision of a mobile games prototype that enable teachers in integrating the educational content and knowledge easily is one alternative in producing educational games for mobile devices. Teachers can focus to think the education contents and creative approaches in order to enrich the students experience and deepen the learning proficiency. Prototype discussed in this paper can be adapted for other game engines in order to adjust the teachers' needs and existing technologies growth.

The gaming distribution channels can be the school networks, web or forums available on the Internet, and application store provided by each mobile device. The most important to be considered is the students easiness to download and use the game or to make a payment for the application if necessary. In the early development of mobile educational games, advertising is a kind of recommended income. The steps to get the advertisement in the mobile application is easy

to be applied, make the student easy to decide to download the application, teachers are not burdened with the sales activity, and educational content can be used by all people. Recommendation for further research is collecting the sales data of mobile educational game application. By using these data, it is expected to be able to find any barriers in educational games mobile marketing, the appropriate mobile marketing techniques in educational games, and their impact on the sustainability of the entrepreneurial school.

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### References

- Adkins, S. S. (2013). *The 2012-2017 Worldwide Game-based Learning and Simulation-based Markets*. Monroe, Washington, USA. Retrieved from [http://www.ambientinsight.com/Resources/Documents/AmbientInsight\\_SeriousPlay2013\\_WW\\_GameBasedLearning\\_Market.pdf](http://www.ambientinsight.com/Resources/Documents/AmbientInsight_SeriousPlay2013_WW_GameBasedLearning_Market.pdf)
- Adkins, S. S. (2015a). *The 2014-2019 Global Edugame Market*. Monroe, Washington, USA. Retrieved from [http://www.ambientinsight.com/Resources/Documents/AmbientInsight\\_2014\\_2019\\_Global\\_Edugame\\_Market\\_Whitepaper.pdf](http://www.ambientinsight.com/Resources/Documents/AmbientInsight_2014_2019_Global_Edugame_Market_Whitepaper.pdf)
- Adkins, S. S. (2015b). *The 2014-2019 Worldwide Mobile Learning Market*. Monroe, Washington, USA. Retrieved from <http://www.ambientinsight.com/Resources/Documents/AmbientInsight-2014-2019-Worldwide-Mobile-Learning-Market-Executive-Overview.pdf>
- Alsagoff, Z. A. (2005). The Challenges & Potential of Educational Gaming in Higher Education. *The Second International Conference on eLearning for KnowledgeBased Society*, 6.1–6.7. Retrieved from [www.elearningap.com/eLAP2005/Proceeding/PP6.pdf](http://www.elearningap.com/eLAP2005/Proceeding/PP6.pdf)
- Greer, T. (2014). *The 2013-2018 Worldwide Game-based Learning and Simulation-based Markets*. Monroe, Washington, USA. Retrieved from [http://www.ambientinsight.com/Resources/Documents/AmbientInsight\\_SeriousPlay2014\\_WW\\_2013\\_2018\\_GameBasedLearning\\_Market.pdf](http://www.ambientinsight.com/Resources/Documents/AmbientInsight_SeriousPlay2014_WW_2013_2018_GameBasedLearning_Market.pdf)
- Hoppenbrouwers, S., & Schotten, B. (2009). A game prototype for basic process model elicitation. *Lecture Notes in Business Information Processing*, 39 LNBIP, 222–236. doi:10.1007/978-3-642-05352-8\_17
- Sanjaya, R. S., Soekesi, A. E. M., & Sitohang, A. P. S. (2015). Technology Entrepreneurship Model Development for Teachers. *International Journal of Technoentrepreneurship*, 3(1), 60–66. doi:10.1504/IJTE.2015.067106
- Sugianto, N., & Wiradinata, T. (2012). An Implementation of Game-Based Learning using Alice Programming Environment. *International Journal of the Computer, the Internet and Management*, 19(SP2), 18.1–18.5. Retrieved from [http://www.ijcim.th.org/SpecialEditions/v20nSP1/02\\_18\\_24B\\_Nehemia.pdf](http://www.ijcim.th.org/SpecialEditions/v20nSP1/02_18_24B_Nehemia.pdf)



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